SEP 2 0 2012

Ms. Josephine Newton-Lund
SLOP/Hanley Area Project Manager
U.S. Army Corps of Engineers – Kansas City District
601 East Twelfth Street/CENWK-PM-ES
Kansas City, Missouri 64106

Re: EPA Comments on the Draft Remedial Action Completion Report – Operable Unit 1
Soils and Groundwater Operable Unit, Operable Unit 1
St. Louis Ordnance Plant, St. Louis, Missouri

Dear Ms. Newton-Lund:

The U.S. Environmental Protection Agency has reviewed the document titled "Draft Remedial Action Completion Report – Operable Unit 1, St. Louis Ordnance Plant, Former Hanley Area, St. Louis, Missouri" prepared by Conti and CH2MHill for the U.S. Army Corps of Engineers, Kansas City District, 88th Regional Support Command and U.S. Army Environmental Command. This document was received on June 22, 2012.

The EPA makes the following general comments:

1. In the CERCLA process, there is a verification process to ensure that a groundwater remedy is performing as designed immediately following the construction of the remedy. This milestone is commonly referred as the Operational and Functional (O&F) determination or Operating Properly and Successfully (OPS) by the NCP under 40 CFR 300.435(f)1 and 40 CFR 300.435(f)2 and under the EPA Guidance entitled "Operation and Maintenance in the Superfund Program" (EPA 540-F-01-004). It is recommended that the groundwater remedy is verified by quarterly samples for a period over a year to determine if the source area has been removed and the solvent plume is no longer advancing or expanding downgradient. Following the verification period, the USACE should make the O&F/OPS determination with concurrence from MDNR and the EPA.

The EPA makes the following technical comments:

2. Section 1.1: Please revise the text of Section 1.1 to cite the pertinent decision document for the site. It seems as though this element was left out of the discussion of the Regulatory Framework.

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3. Section 1.3, line 9: If Hanley did not use the wells or sumps on the property for wastewater disposal, what was the disposal method? Please revise the text to add this information, if it is known. If it is not known, please revise the text to discuss this gap.

4. Section 1.4.1, Geology, Page 1-2: In the first paragraph, the narrative indicates that fill soils consist of typical city fill; however, one of the drillers observations included up to 12 feet of sand fill in MW-118, as noted in Appendix A-1. Sand fills have the potential to be preferential pathways for contaminant migration. Please revise the text to clarify whether sand is wide spread as fill and also speak to the densities of the fill encountered. Figure 1-4 also depicts fill soils from SB-023 and continuing to MW-115. Have site pre-development stages been checked by historical aerial photographs or older topographic maps? Please revise the text to comment accordingly.

5. Section 1.4.1, Geology, Page 1-2: In the third paragraph, the narrative indicates competent shale (Lagonda Fm.) underlies the weathered shale. Figure 1-4 of the report depicts this formation dipping to the east with only two borings encountering this shale. Please clarify if the dip of this formation can be determined with only two locations. Clarification is also needed for the coal stringer that only one of the borings encountered.

6. Section 1.4.2, Hydrogeology, Page 1-2: In the first paragraph, the narrative indicates that depth to groundwater varies from 1 to 24 feet below ground surface. On Figure 1-4 it appears the groundwater has a preferential pathway in the base rock of Stratford Avenue. Also, testing of groundwater in a saturated coal seam may contain metals other than site specific COCs. Please comment accordingly. Additionally, Figure 1-4 should depict all utility corridors that either cross or parallel Stratford Avenue. The backfill of these utilities can provide preferential pathways for contaminant migration.

7. Section 1.7, Page 1-4, Lines 13-18 and Section 2.1, Page 2-1, Lines 34-40: The city of St Louis Ordinance 66777 cannot stand alone as the means to provide appropriate institutional controls for land use of this area. This should make reference to the land use control document in order to provide restrictions on the use of groundwater in the future.

8. Table 1-1, "2004-Sampling, Asbestos Abatement and Building Demo by SCS Engineers": Please revise the text to state if explosives or metals were detected in the described samples.

9. Section 2: The report will benefit from a discussion of unacceptable risks, by media, receptor and COC, prior to describing the RAOs of Section 2.1. This should be done as a means of providing the basis for the RAOs. It would also be helpful to revise the text to summarize the approach used to segregate the site into the exposure units identified in the text and on Figure 2-1.

10. Section 2.1, first bullet, lines 5 and 6, also Figure 2-1: On-site soil contamination is discussed here and Figure 2-1 describes "Subsurface Soil Exposure Units." Is on-site surface soil not contaminated? In later sections, for example 4.2, the removal of surface soil is specifically described. Please revise the text of Section 2-1 to clarify the status of surface soil.

11. Section 2.1, third bullet: Lists of sample locations are presented here. As an aid to the reader, please revise to provide some information as to where these samples can be found on Figure 2-2. Perhaps the associated exposure units can be indicated.

12. Section 2.1, fourth bullet, line 19: How would future human receptors become exposed to sediments within the on-site powder wells? Earlier sections of the text discuss the prohibition established by the city of using groundwater for potable purposes. So it is not understood how exposure could occur. Please revise the text for clarification.

13. Section 2.2, lines 36-38: The text states "The five-year review will be terminated once COCs are at or below the remediation goals and monitoring confirms that no unacceptable risk is posed by Plume C." Five-year reviews should the unremediated portion of Plume A underneath Stratford Avenue.

14. Section 3.2.1, line 2: For clarity, please insert ", on Figure 2-2" following "Section 2.1."

15. Section 3.2.2, line 23: There appears to be text missing from this sentence between "and" and "of the." Please correct the text as appropriate.

16. Section 4.2.1.1, line 22: This section describes the removal of surface soil from Area A, followed by decontamination of "exposed paved surfaces within the planned remediation area." What are these paved surfaces? Were they previously covered with the soil that was removed (e.g., subsurface structures) or are they existing surface features (e.g., sidewalks or parking lots? Also, the text does not describe what the decontamination is for - presumably PCBs - please clarify. Regarding decontamination, how was this performed? The procedures used should be provided in the text. (Later, in Section 4.2.1.2, paragraph four, decon procedures are described. If these are the decon procedures that should have been described earlier, in Section 4.2.1.1, please move this information up.) Please revise this section as required for clarity.

17. Section 4.2.2: Were confirmation soil samples not required following excavation of soil in Area B? Excavation is described, followed by backfilling. Please revise the text to discuss the issue of confirmation sampling, whether or not it was required.

18. Section 4.2.3: Same issue as comment 16, but in regard to Area C.

19. Section 4.2.4: Same issue as comment 16, but in regard to Area D.

20. Section 4.2.6: Same issue as comment 16, but in regard to Area F.

21. Section 4.3, Powder Wells: This section describes the removal of sediment and debris from the powder wells. However, the report has not yet described the physical characteristics of these wells. What is the inner diameter, what material are they made of, how deep do they extend into the subsurface, etc.? Please revise the text to provide more information about these wells.

22. Section 4.4.4, line 5: The ZVI dosage here is 1% by mass, while earlier, in Section 4.4.2, a dosage of 0.6% is noted. Was 0.6% the minimum dose with the safety factor of 25? Presumably the 1% dose is a working dose to ensure that 0.6% is delivered, at a minimum? Please revise the text for clarity.

23. Section 2.2, lines 36-38: The text states "The 5-year review will be terminated once COCs are at or below the remediation goals and monitoring confirms that no unacceptable risk is posed by Plume C." Five year reviews should also include the unremediated portion of plume A underneath Stratford Avenue.

24. Section 5.5.1, line 21: Backfill and topsoil was found to exceed RSLs for arsenic, yet were below the site RGs or background values. The report notes that the USACE approved use of this material, please also revise the text to indicate if the EPA and MDNR were in concurrence.

25. There is no information provided as to the performance monitoring regarding the reduction of chlorinated solvents in the subsurface. Please revise the text to add another section describing the sampling and analysis schedule to track solvent contamination reduction to evaluate the effectiveness of the ZVI treatment.

26. Appendix I.1 Contaminate Mass and ZVI Dose Calculations: This table indicates the quantities used for dose calculations. The soil moisture content used (25.6%) is quite higher than the moisture contents that resulted from the ZVI mixing process. One soil moisture content listed in Appendix I.2 was near 9%, with many around 15%. This lower soil moisture content would change the dose rate for the ZVI. Please comment accordingly.

The EPA makes the following editorial comments:

27. Acronyms and Abbreviations: Please revise to also include: DCE, MCL, psi and RCRA.

28. Section 1.3, line 37 and 38: For clarity, please add "Plant Area" before "No. 1" and "No. 2."

29. Section 3.2.1, line 3: For clarity, please insert "below," after "provide."

30. Section 3.2.2, line 23: For clarity and if correct, please insert the reference citation for the technical memo provided in Appendix B. Presumably, this is the CH2M Hill, 2012 citation.

31. Section 3.3, line 38: For the reference cited here, please verify if it should not instead be "2011b" rather than "2011a."

32. Section 3.4, line 42: For clarity, please insert "sample results" following "These."

33. Section 4.2, line 38: Please revise this sentence to "… RAOs, previously discussed in Section 2.1:."

34. Section 4.3.3, line 26: Remove the first "the" from this sentence.

If you have questions, please contact me at (913) 551-7520.

Sincerely,

Matthew Jefferson
Remedial Project Manager
Missouri/Kansas Remedial Branch
Superfund Division

cc: Jim Harris, MDNR
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